



**APPLICATIONS**

Wireless Network  
Telecom/Datacom  
Industry Control System  
Distributed Power Architectures  
Semiconductor Equipment

**FEATURES**

- 50 WATTS MAXIMUM OUTPUT POWER
- SINGLE OUTPUT UP TO 15A
- COMPACT 2.40 X 2.28 X 0.50 INCH PACKAGE
- HIGH EFFICIENCY UP TO 91%
- INPUT RANGE FROM 18VDC TO 36VDC AND 36VDC TO 75VDC
- FIXED SWITCHING FREQUENCY(300KHz)
- HALT TESTED
- INDUSTRY STANDARD FOOTPRINT
- ADJUSTABLE OUTPUT VOLTAGE
- NO MINIMUM LOAD
- UNDER-VOLTAGE LOCKOUT
- INPUT TO OUTPUT ISOLATION (BASIC INSULATION)
- CE MARK MEETS 2006/95/EC, 93/68/EEC AND 2004/108/EC
- UL60950-1, EN60950-1 AND IEC60950-1 LICENSED
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

**OPTIONS**

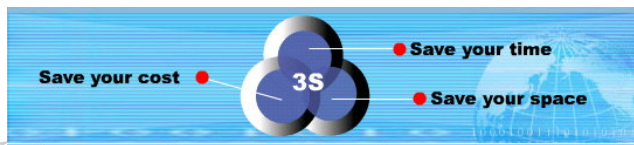
Negative & Positive logic Remote on/off, Pin length

**DESCRIPTION**

HEC50-S single output DC/DC converters provide up to 50 watts of output power in an industry standard half-brick package and footprint. These units are specifically designed to meet the power needs of low-voltage silicon. All models feature a wide input range, trimmable output voltage and a 15A current rating.

**TECHNICAL SPECIFICATION** All specifications are typical at nominal input, full load and 25°C otherwise noted

OUTPUT SPECIFICATIONS			INPUT SPECIFICATIONS			
Output power		50 Watts, max.	Input voltage range	24V nominal input 48V nominal input	18 – 36VDC 36 – 75VDC	
Voltage accuracy	Full load and nominal Vin	± 1.5%	Input filter		L-C type	
Minimum load		0%	Input surge voltage 100mS max	24V input 48V input	50VDC 100VDC	
Voltage adjustability (Note 5)		+ 10% , -20%	Start up time	Nominal Vin and constant resistive load	Power up Remote ON/OFF	25mS, typ. 25mS, typ.
Line regulation	LL to HL at Full Load	See table	Input reflected ripple current	24V input 48V input	50mA <sub>p-p</sub> 20mA <sub>p-p</sub>	
Load regulation	No load to Full load	See table	Start-up voltage	24V input 48V input	17VDC 34VDC	
Remote sense (Note 5)		10% of Vout	Shutdown voltage	24V input 48V input	15VDC 32VDC	
Ripple and noise (Note 6) 20MHz bandwidth		100mV <sub>p-p</sub>	Remote ON/OFF (Note 7)			
Temperature coefficient		±0.02% / °C, max.	(Negative logic)	ON=Short or 0V < Vr < 1.2V, I <sub>IN</sub> =1mA max. OFF=Open or 3V < Vr < 15V, I <sub>IN</sub> =50µA max.		
Transient response recovery time 25% load step change		200µS	(Positive logic)	ON=Open or 3V < Vr < 15V, I <sub>IN</sub> =50µA max. OFF=Short or 0V < Vr < 1.2V, I <sub>IN</sub> =1mA max.		
Over voltage protection threshold (Hiccup)		115% ~ 130% of Vout	Input current of remote control pin	Nominal Vin	-0.5mA ~ 0.5mA	
Over current protection threshold		110% ~ 140% of Iout Rated	Remote off state input current	Nominal Vin	20mA	
Short circuit protection		Hiccup, automatics recovery	<b>ENVIRONMENTAL SPECIFICATIONS</b>			
GENERAL SPECIFICATIONS			Operating base-plate temperature range (Note 8)		-40°C to +100°C (with derating)	
Efficiency		See table	Over temperature protection		110°C	
Isolation voltage	Input to Output Input to Case Output to Case	1600 VDC, min. 1000 VDC, min. 1000 VDC, min.	Humidity max, Non-condensing		95%	
Isolation resistance		10 <sup>7</sup> ohms, min.	Storage temperature range		-55°C to +125°C	
Isolation capacitance		2500 pF, max.	Thermal shock		MIL-STD-810F	
Switching frequency		300 KHz, typ.	Vibration		MIL-STD-810F	
Approvals and standard		IEC60950-1, UL60950-1, EN60950-1	<b>EMC CHARACTERISTICS</b>			
Case material		Open with Aluminum base-plate	EMI (Note 9)	EN55022	Class A	
Weight		50g (1.76oz)	Radiated immunity	EN61000-4-3	10 V/m Perf. Criteria A	
MTBF (Note 1)	BELLCORE TR-NWT-000332 MIL-HDBK-217F	3.000 x 10 <sup>6</sup> hrs 2.560 x 10 <sup>5</sup> hrs	Fast transient (Note 10)	EN61000-4-4	± 2KV Perf. Criteria B	
			Surge (Note 10)	EN61000-4-5	± 1KV Perf. Criteria B	
			Conducted immunity	EN61000-4-6	10 Vr.m.s Perf. Criteria A	

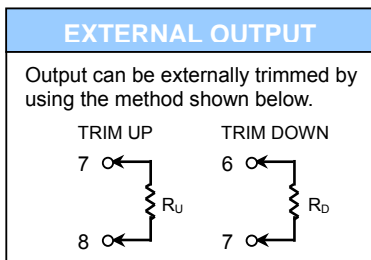
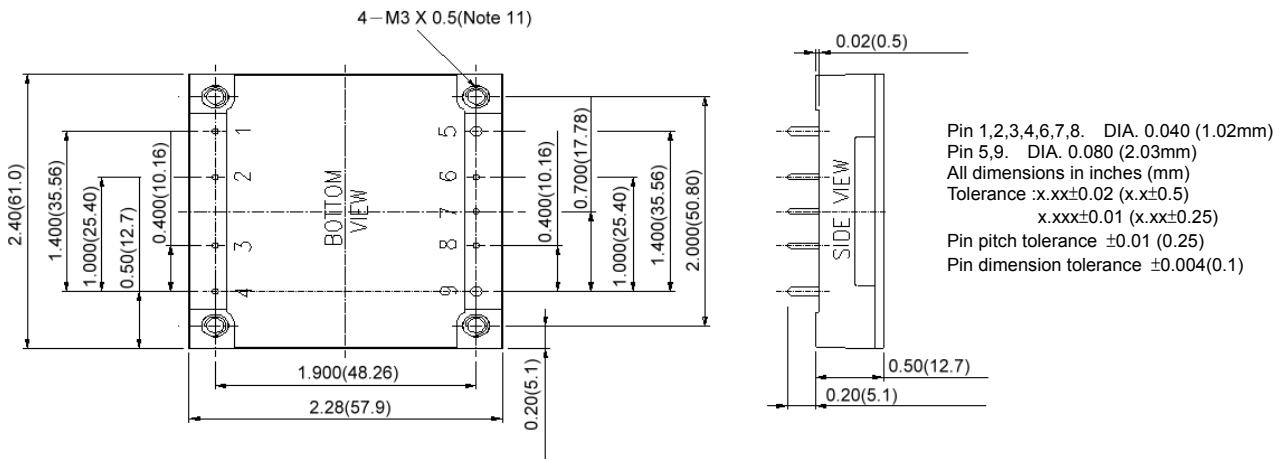




**50WATTS SINGLE OUTPUT  
DC-DC CONVERTER**

Model Number	Input Range	Output Voltage	Output Current		Line regulation	Load regulation	Input Current		Eff <sup>(4)</sup> (%)
			Min. load	Full load			No load <sup>(3)</sup>	Full load <sup>(2)</sup>	
HEC50-24S1P8	18 – 36 VDC	1.8 VDC	0mA	15 A	4 mV	6 mV	120mA	1.36 A	86
HEC50-24S2P5	18 – 36 VDC	2.5 VDC	0mA	15 A	5 mV	8 mV	100mA	1.86 A	87
HEC50-24S3P3	18 – 36 VDC	3.3 VDC	0mA	15 A	7 mV	10 mV	120mA	2.40 A	89
HEC50-24S05	18 – 36 VDC	5 VDC	0mA	10 A	10 mV	15 mV	120mA	2.40 A	90
HEC50-24S15	18 – 36 VDC	15 VDC	0mA	3.3 A	30 mV	45 mV	190mA	2.40 A	89
HEC50-48S1P8	36 – 75 VDC	1.8 VDC	0mA	15 A	4 mV	6 mV	80mA	0.67 A	87
HEC50-48S2P5	36 – 75 VDC	2.5 VDC	0mA	15 A	5 mV	8 mV	80mA	0.93 A	88
HEC50-48S3P3	36 – 75 VDC	3.3 VDC	0mA	15 A	7 mV	10 mV	110mA	1.19 A	90
HEC50-48S05	36 – 75 VDC	5 VDC	0mA	10 A	10 mV	15 mV	90mA	1.19 A	91
HEC50-48S15	36 – 75 VDC	15 VDC	0mA	3.3 A	30 mV	45 mV	130mA	1.20 A	90

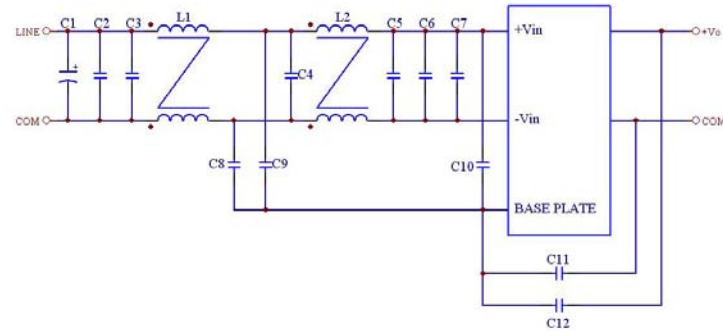
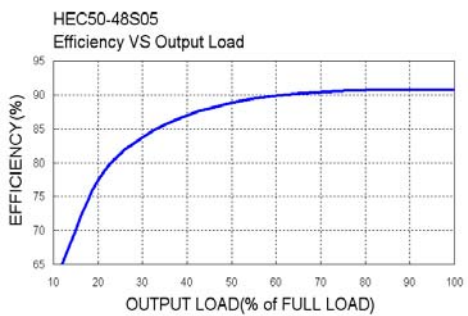
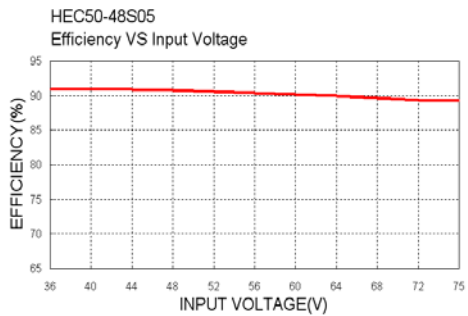
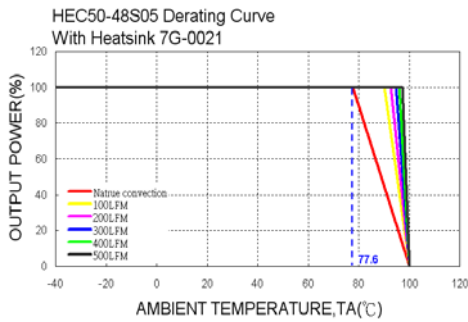
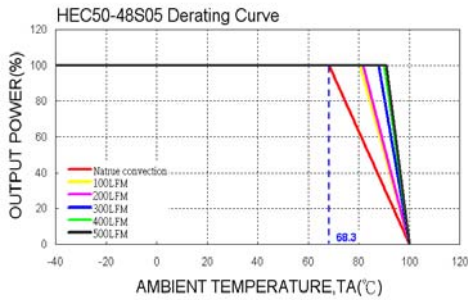
- Note**
- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C. MIL-HDBK-217F Notice2 @Ta=25 °C, Full load(Ground, Benign, controlled environment).
  - Maximum value at nominal input voltage and full load.
  - Typical value at nominal input voltage and no load.
  - Typical value at nominal input voltage and full load.
  - Maximum output deviation is 10% inclusive of remote sense. If remote sense is not being used, the + sense should be connected to its corresponding +OUTPUT and likewise the -sense should be connected to its corresponding -OUTPUT.
  - Measured with a 1µF M/C and a 10µF T/C.
  - The negative/ positive logic and pin length are optional ( see table ). The pin voltage is referenced to -Vin.
  - Heat sink is optional and P/N: 7G-0021A-F, 7G-0022A-F, 7G-0023A-F, 7G-0024A-F.
  - The HEC50 meets EN55022 class A and class B only with external components connected with the input pins.
  - An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
  - The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220µF/100V, ESR 48mΩ .
  - BASEPLATE GROUNDING : Base-plate should be grounded at one of the four screw bolts prior to operation.
  - The converter is provided by basic insulation.



PIN CONNECTION		
PIN	Define	Diameter
1	- INPUT	0.04 Inches
2	CASE	0.04 Inches
3	CTRL	0.04 Inches
4	+ INPUT	0.04 Inches
5	- OUTPUT	0.08 Inches
6	- SENSE	0.04 Inches
7	TRIM	0.04 Inches
8	+ SENSE	0.04 Inches
9	+ OUTPUT	0.08 Inches

PRODUCT OPTIONS TABLE	
Option	Suffix
Negative remote ON/OFF logic, 0.20" pin length (standard)	-
Negative remote ON/OFF logic, 0.145" pin length	-L
Negative remote ON/OFF logic, 0.11" pin length	-K
Positive remote ON/OFF logic, 0.20" pin length	-P
Positive remote ON/OFF logic, 0.145" pin length	-S
Positive remote ON/OFF logic, 0.11" pin length	-M

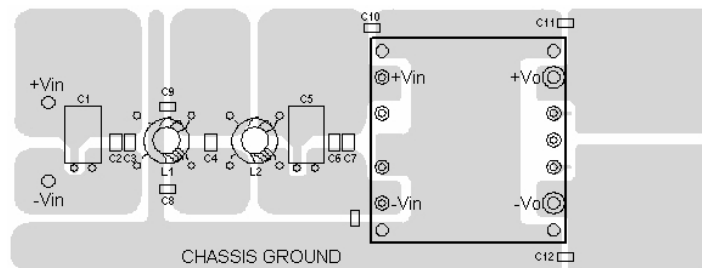
**Example : HEC50-48S3P3-P**



**Recommended Filter for EN55022 Class B Compliance**

The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

	C1	C2	C3	C4	C5
HEC50-xxx	220μF /100V	2.2μF /100V	2.2μF /100V	2.2μF /100V	100μF/100V
	C6	C7	C8	C9	C10
	2.2μF /100V	2.2μF /100V	1.5nF /3KV	1.5nF /3KV	1.5nF /3KV
	C11	C12	L1	L2	
	1.5nF /3KV	1.5nF /3KV	1400.4μH	304.98μH	



**Recommended EN55022 Class B Filter Circuit Layout**

